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EXAMINER	
CHANKONG, DOHM	
ART UNIT	**PAPER NUMBER**
2152	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/893,584	GANTI ET AL.	
	Examiner	Art Unit	
	Dohm Chankong	2152	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-9 and 17-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-9, and 17-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1> This action is in response to Applicant's amendment. Claims 2 and 29-35 are cancelled. Claims 1, 3-5, 9, 17, 27 and 28 are amended. Claims 1, 3-9, and 17-28 are presented for further examination.

2> This is a final rejection.

Response to Arguments

3> Applicant's arguments with respect to claims 1 and 3-28 have been considered but are not persuasive for the reasons discussed below. Additionally, Applicant's amendment of the independent claims ["leaky bucket" was amended to "cascaded policer"] necessitates the new grounds of rejection.

The Santiago Reference

Applicant's analysis of Santiago seems to center on two essential propositions: (1) each class (or sub-flow) in the claimed invention has its own guaranteed policer; in other words, each class has it owns guarantee while Santiago discloses only guaranteeing only one sub flow while utilizing "best efforts" on the other sub flows, thus allowing Applicant's invention allows for the flow's total guaranteed bandwidth is equal to the sum of the guaranteed bandwidth of each of the sub flows , Applicant's remarks, pg. 12, ll. 6-10, pg. 13, ll. 7-17; and (2) in the claimed invention, a policer of each lower priority class is linked to the policer of the immediately higher priority class. Id. at pg. 12, ll. 11-15.

In regards to point (1), Applicant's analysis of Santiago is incomplete. Santiago discloses that lower-priority sub flows are policed in a best effort manner "but guaranteed to a predetermined rate limit" [0096]. Therefore, Applicant's argument that only one sub flow is provided guaranteed performance is unpersuasive. All of Santiago's sub flows receive a guaranteed predetermined rate limit, and best flow efforts seem to apply if the sub flow asks for more than their guaranteed amount.

The best effort policing of the sub flows only applies when the sub flows are above their guaranteed limit [0095 : "while using "best efforts" for other sub flows beyond their respective rate limits"]. Furthermore, Santiago clearly expresses that the total bandwidth of the entire flow is a total of the guaranteed bandwidths of each of the sub flows [Figure 13 | 0096].

In relation to Applicant's claim, this part of Santiago's disclosure is significant. Applicant asserts that a differentiating idea of the present invention is the ability to guarantee rates for multiple levels of priority, each with its own guarantee. Id. at pg. 13, ll. 6-11. Santiago clearly discloses an analogous implementation. Each sub flow has their own predetermined bandwidth guarantee (see discussion above) and the sub flows having a priority based in party on the traffic class that flows through it [0012].

Further, Applicant asserts that the present invention provides precise fair control over distribution of excess bandwidth while Santiago, who uses "two modes of sub flow control (depending on the overall flow), and its limitation of only one guarantee rate sub flow. Id. at pg. 13, ll. 14-17. As discussed above, Santiago discloses that all sub flows are guaranteed. Further, Santiago discloses "allocation of remaining bandwidth for that flow will be biased

towards packets associated to sub flows of higher priority" [0060]. This functionality suggests that distributing "remaining bandwidth" goes first to those sub flows of higher priority.

In sum, Applicant's analysis of the Santiago reference are not supported by the reference and therefore Applicant's arguments are not persuasive.

Conclusion

Applicant has substantially broadened claim 1. The Office maintains that the Santiago reference still applies. Other claims were amended to resolve 35 U.S.C § 112 issues but Santiago still applies for the reasons discussed above. Applicant's claims and amendments do not distinguish Applicant's invention over the prior art references.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4> Claims 1-8, 17-19 and 22-28 are rejected under 35 U.S.C § 103(a) as being anticipated by Santiago et al, U.S Patent No. 2002|0186661 A1 ["Santiago"].

5> As to claim 1, Santiago discloses a method of cascaded policing of a service, comprising a first and a second priority class, for a two-tier rate guarantee [0055, 0076, 0077 where : Santiago polices both the rate guarantee for the overall flow as well as each individual guarantee for the sub flow that makes up the flow] comprising the steps of:

policing the traffic of the first priority class (first class traffic) at a rate guarantee based upon a policer mechanism, wherein the policer has a first traffic capacity for said first priority class, and wherein first class traffic below the first traffic capacity is a conforming first class traffic [0010, 0013, 0016, 0078, 0082, 0083 where: Santiago's flow is analogous to a service and his first level sub flow is analogous to a first priority class. The first level sub flow has its own rate guarantee and anything below the guarantee is marked as a conforming traffic class];

policing the traffic of the second priority class (second class traffic) at a rate guarantee based upon a policer mechanism, wherein the policer has a composite traffic capacity being composed of a second traffic capacity plus the first traffic capacity diminished by the rate of the conforming first class traffic [0012, 0013, 0015, 0016, 0071, 0078, 0080, 0083 where: Santiago's second level flow is analogous to a second priority class. The bandwidth of the second level flow is determined by the guaranteed bandwidths of the first and second level flows, minus the actual bandwidth utilization of the first level flow. In essence, the second level flow utilizes any bandwidth not utilized by the higher priority, first level flow: "credits that otherwise would have been used by these packets remain in the flow's credit pool, which effectively makes these unused credits available for packets of sub flows that have not exceeded their respective rate limits"].

While Santiago does not expressly disclose a cascaded policer mechanism, his hierarchical policing mechanism is analogous in functionality to the claimed cascaded policer.

6> As to claim 3, Santiago discloses a method wherein the second class traffic capacity is defined as conforming second class traffic if it is below the rate allowed by the composite traffic capacity [0071, 0077, 0078, 0082, 0083 where: for example, one flow is analogous to a service, and its sub flows are analogous to a first and second traffic class. The flow and its sub flows are bounded by bandwidth set forth by the contract or QoS].

7> As to claim 4, Santiago discloses a method wherein the rate guarantee includes a traffic class burst tolerance guarantee [Table 1 | 0086, 0090, 0091, 0092].

8> As to claim 5, Santiago discloses a method of cascaded policing of a service for a two-tier rate guarantee comprising the steps of:

policing the service at a service rate guarantee based upon a policer mechanism, wherein the policer has a finite traffic capacity for said service, the finite traffic capacity comprises a plurality of classes of traffic capacities having their respective plurality of traffic classes rate guarantees arranged in a descending order of priorities [0012, 0015, 0016, 0039, 0067, 0071, 0077, 0079 where : Santiago discloses a "hierarchical and layered" prioritization and that higher priority flows/sub flows are handled before the lower priority flows/sub flows];

policing at least one of the plurality of classes of traffic capacities at its respective traffic class rate guarantee based upon a policer mechanism, said policer has a traffic capacity which is equal to the at least one of the plurality of classes of traffic capacities [0015, 0071, 0078];

policing each of the remaining plurality of classes of traffic capacities at its respective traffic class rate guarantee based upon policer mechanism, each of the policers has a traffic capacity which is equal to each of the remaining plurality of classes of traffic capacities [0012, 0013, 0071, 0083]; and

if not all of the capacity of the policers of said at least one of the plurality of classes of traffic capacities is being used,

storing one or more of the remaining classes of traffic capacities of said plurality of classes of traffic capacities, which have lower traffic classes rate guarantees and have not being policed in step (g), into said policer [0012, 0013, 0034, 0071, 0083], and

policing the classes of traffic capacities in said policer at an aggregate rate of the plurality of traffic classes rate guarantee [0077, 0078, 0082, 0083, 0096 where : the sub flows of a flow are bound by the total rate limit of the flow (aggregate rate of its sub flows)].

While Santiago does not expressly disclose a cascaded policers, his hierarchical policing mechanism is analogous in functionality to the claimed cascaded policer.

9> As to claim 6, as it does not teach or further define over the limitations of claim 2, it is similarly rejected for the same reasons set forth for claim 2, supra.

10> As to claim 7, Santiago discloses a method wherein each of the remaining portions of the plurality of traffic capacities is marked as conforming if allowed by the aggregate rate of the plurality of traffic classes rate guarantees and non-conforming if found to exceed the aggregate rate of the plurality of traffic classes rate guarantees [0082, 0083].

11> As to claim 8, as it is does not teach or further define over the limitations of claim 5, it merely formulates the limitations of claim 5 into equation format], it is similarly rejected for the same reasons as set forth for claim 5, supra.

12> As to claims 17-19, as they are merely claims to apparatuses that execute the steps of the method of claims 1-3 respectively, they do not teach or further define over the claimed limitations. Therefore claims 17-19 are similarly rejected for the same reasons set forth claims 1-3, supra.

13> As to claims 20 and 21, as they do not teach or further define over the limitations of the methods of claims 6 and 7, respectively [they merely formulate the stated limitations into an equation format], claims 20 and 21 are similarly rejected for the same reasons set forth for claims 6 and 7, respectively.

14> As to claim 22, Santiago discloses the method as described in claim 1, wherein the step (a) comprises policing at a service rate guarantee and a service burst tolerance guarantee [0077 ("bounded by the contracted bandwidth or QoS") and 0085 ("PBS - peak burst size")].

15> As to claim 23, Santiago discloses the method of claim 5, wherein the steps (f) and (g) comprise policing at a traffic class rate guarantee and a traffic class burst tolerance guarantee [0077, 0085 ("SCBS - committed burst size for the sub flow")].

16> As to claim 24, Santiago discloses the method as described in claim 5, wherein the step (e) comprises policing at a service rate guarantee and a service burst tolerance guarantee [0077 ("bounded by the contracted bandwidth or QoS") and 0085 ("PBS - peak burst size") where : Santiago's overall flow is analogous to the service and its sub flows correspond to traffic classes within the service].

17> As to claim 25, Santiago discloses the apparatus of claim 17, wherein the policer is a leaky bucket mechanism [0071].

18> As to claim 26, Santiago discloses the apparatus of claim 17, wherein the policer comprises a buffer storage for storing the first class traffic capacity and another buffer storage for storing the second class traffic capacity [0051, 0055].

19> As to claim 27, Santiago discloses the apparatus of claim 17, wherein the steps comprise providing means for policing at a traffic class rate guarantee and a traffic class burst tolerance guarantee [0077, 0085 ("SCBS - committed burst size for the sub flow")].

20> As to claim 28, Santiago discloses the apparatus as described in claim 17, wherein the step (r) comprises providing means for policing at a service rate guarantee and a service burst tolerance guarantee [0077 ("bounded by the contracted bandwidth or QoS") and 0085 ("PBS - peak burst size") where : Santiago's overall flow is analogous to the service and its sub flows correspond to traffic classes within the service].

21> Claim 9 is rejected under 35 U.S.C § 103(a) as being unpatentable over Santiago in view of Fichou et al, U.S Patent No. 6.072.773 ["Fichou"].

22> Santiago discloses a method of:

policing the service at a service burst tolerance guarantee based upon a leaky bucket mechanism, wherein the leaky bucket has a finite traffic capacity for said service, the finite traffic capacity comprises a plurality of N traffic capacities, C_i, i=1, 2,..,N and N>2, having their respective plurality of burst tolerance guarantees, BT_i, i=1, 2,...,N and N>2 [Table 1 | 0071, 0085, 0086, 0087 where : each flow has associated variables including the committed burst size and peak burst size];

policing C_i traffic capacity at its respective burst tolerance guarantee BT_i , based upon a leaky bucket mechanism, said leaky bucket has a traffic capacity, which is equal to the C_i traffic capacity [Figure 13 | 0071, 0086];

policing each of the C_1, C_2, ..., C_{i-1}, traffic capacities at its respective burst tolerance guarantee BT_1, BT_2,..., BT_{i-1} based upon cascaded buckets mechanism, the leaky buckets having C_1, C_2, ..., C_{i-1}, traffic capacities [0012, 0013, 0071, 0083, 0085]; and

if not all of the C_i traffic capacity is being used,

storing one or more of the C_1, C_2, ..., C_{i-1}, traffic capacities, which is not being policed in step (p), into said leaky bucket [0071, 0078, 0083] : "credit bucket"].

Santiago does disclose utilizing burst tolerance guarantees and policing the traffic capacities of said leaky bucket but does not explicitly disclose policing the traffic capacities of said leaky bucket at an aggregate burst tolerance guarantee BA_i, which is $BA_i = \sum_{i=1}^{N} BT_i$.

While Santiago does not expressly disclose a cascaded policer mechanism, his hierarchical policing mechanism is analogous in functionality to the claimed cascaded policer.

23› Fichou discloses policing traffic capacities at an aggregate burst tolerance which is the sum of the burst tolerances of the respective traffic capacities [column 7 «lines 46-55» | column 25 «line 4» where: Fichou does not explicitly disclose the equation of claim 9. However his stated functionality of the burst tolerances is that the burst tolerance for both low and high priority traffic is taken into an aggregate burst tolerance : BT(0+1) where BT(0)

and BT(1) represent the respective burst tolerances for low and high priority traffic]. It would have been obvious to one of ordinary skill in the art to incorporate Fichou's aggregate burst tolerance into Santiago's cascading policing method to enable Santiago's method to take into account the burst tolerances of each of the sub flows. Such an implementation would facilitate a more accurate enforcement of Santiago's shared bandwidth amongst the sub flows.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Henrion et al, U.S Patent No. 6469.982;

Amou et al, U.S Patent Publication No. 2001|0026535.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dohm Chankong whose telephone number is 571.272.3942. The examiner can normally be reached on Monday-Thursday [7:00 AM to 5:00 PM].

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bunjob Jaroenchonwanit can be reached on 571.272.3913. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DC

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